UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

WSOU INVESTMENTS, LLC D/B/A BRAZOS LICENSING AND DEVELOPMENT,	**Case No. 6:20-cv-01012** **Case No. 6:20-cv-01017** **Case No. 6:20-cv-01022**
Plaintiff	
v.	**JURY TRIAL DEMANDED**
TP-LINK TECHNOLOGY CO., LTD.,	
Defendant	

PLAINTIFF'S CLAIM CONSTRUCTION REPLY BRIEF

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I.   U.S. PATENT NO. 7,174,180 (CASE NO. 6:20-CV-01012) CLAIM TERMS

A.   "a processor for assigning scheduling priorities to each mobile unit" (claims 1, 11, and 13)

Defendant argues Claim 1 "does not provide an algorithm" but rather "mimics the functional language recited for claim 1." Dkt. 39 at 1-2.

Defendant's motive for advocating an elaborate, complex function is clear. Defendant argues that Claim 1's algorithm is simply functional language. To the contrary, Claim 1 does not mimic functional language insofar as it does not simply disclose the function or desired outcome of the processor, but rather provides "a series of instructions for the computer to follow." *Typhoon Touch Techs., Inc. v. Dell, Inc.*, 659 F.3d 1376, 1384 (Fed. Cir. 2011). The function is much simpler than Defendant's four bullet-point list. The function is "assigning scheduling priorities to each mobile unit." *See* PX 180 at 15:22-23. The rest of Claim 1 is the step-wise algorithm that connotes structure. *See St. Isidore Rsch., LLC v. Comerica Inc.*, No. 2:15-CV-1390-JRG-RSP, 2016 WL 4988246, at *13 (E.D. Tex. Sept. 19, 2016). Defendant's attempt to mislabel the algorithm performed by the processor as instead "functional language" should thus be rejected.

A POSITA would understand that Claim 1 (as informed by the specification) discloses an algorithm for "assigning scheduling priorities to each mobile unit" such that the scheduling priority assigned to a mobile unit is determined by the steps as set forth in Claim 1:

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a processor for assigning scheduling priorities to each mobile unit, the scheduling priority assigned to a mobile unit determining a relative allocation of bandwidth resources to that mobile unit, the scheduling priority assigned to a mobile unit being based at least in part on the sensitivity to delay of one or more data streams serving the mobile unit and the delay currently experienced by the one or more data streams serving the mobile unit, wherein a data stream urgency value is computed for each data stream serving each mobile unit, wherein the data stream urgency value for a data stream is computed based on the sensitivity to delay of the data stream and the delay currently experienced by the data stream, wherein a unit urgency value is assigned to the mobile unit, the unit urgency value being the highest data stream urgency value for the data streams serving the mobile unit, and wherein the scheduling priority for the mobile unit is based on the unit urgency value for the mobile unit.	**Function** (top) **Algorithm** (bottom)

PX 180 at Claim 1. The algorithm is further confirmed by Figure 3 and linked passages in the specification. *See id*. at Fig. 3, 14:25-15:3. A POSITA would readily understand that Claim 1 contains "a mathematical formula, or a word description of the procedure to be implemented by a suitably programmed computer." *Typhoon Touch*, 659 F.3d at 1384. This is *how* "assigning scheduling priorities to each mobile unit" is accomplished. Specifically, the algorithm for "assigning scheduling priorities to each mobile unit" such that the scheduling priority assigned to a mobile unit is determined by:

1. Determining the sensitivity to delay of one or more data streams serving the mobile unit and the delay currently experienced by the one or more data streams serving the mobile unit,

2. Computing the data stream urgency value for each data stream serving each mobile unit based on (i) the sensitivity to delay of the data stream and (ii) the delay currently experienced by the data stream,

3. Assigning the unit urgency value to the mobile unit, with the unit urgency value being the highest data stream urgency value for the data streams serving the mobile unit, and

4. Scheduling priority for the mobile unit based on the unit urgency value for the mobile unit.

Defendant's argument that Figure 3 "simply mimics the functional language already recited in claim 1" confirms the purported function Defendant identified actually contains the algorithm.

Moreover, the specification describes Figure 3 as illustrating "a *process* of scheduling service in wireless networks according to an aspect of the present invention." PX 180 at 2:45-47 (emphasis added). The "process" (not function) disclosed in Figure 3 is an algorithm. Accordingly, a POSITA would understand that Claim 1 (as informed by the specification) discloses an algorithm.

B.   "a priority computation module" (claims 14, 15, and 17)

1.   The term is not subject to means-plus-function treatment

The term does not use the word "means" and thus carries a presumption that § 112, ¶ 6 does not apply. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (*en banc*). The term *a priority computation module*, which defines the term by its function, is not improper and "not sufficient to convert a claim element containing that term into a 'means for performing a specified function' within the meaning of [35 U.S.C. § 112(6)]." *See Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1374–75 (Fed. Cir. 2014). This Court has construed a similar term— which used the word "module"—as not subject to § 112, ¶ 6. *See Parkervision, Inc. v. Intel Corp.*, Case 6:20-cv-00562-ADA, Dkt. 61 at 4 (July 22, 2021) (Finding "delay module to delay instances of an output signal" is not subject to § 112, ¶ 6.) A POSITA would understand that the priority computation module assigns a scheduling priority.

Defendant attempts to dismiss *St. Isidore Rsch., LLC v. Comerica Inc.* because the claim in that case listed detailed steps for the function. Defendant has again mis-identified the function to generate an argument that there is no accompanying algorithm. The function is far simpler than Defendant's five bullet-point list. It is a priority computation model for "examining the status information and the unit parameters for each mobile unit and to assign a scheduling priority to each mobile unit." *See* PX 180 at 17:28-32. Here again—as Defendant did in the prior claim

term—Defendant attempts to inoculate itself from what is clearly an algorithm by identifying it as

the function. Claim 14 contains an algorithm—a step-wise description of the operation of the

priority computation module:

a priority computation module for examining the status information and the unit parameters for each mobile unit and to assign a scheduling priority to each mobile unit, the priority computation module assigning a priority to each mobile unit based at least in part on the delay sensitivity of one or more data streams serving the mobile unit and the delay experienced by the one or more data streams serving the mobile unit, wherein the priority computation module is further operative to compute an urgency value for each data stream serving each mobile unit, the data stream urgency value for a data stream being computed based on the sensitivity to delay of the data stream and the delay currently experienced by the data stream, wherein the priority computation module is further operative to assign a unit urgency value to the mobile unit, the unit urgency value being the highest data stream urgency value for the data streams serving the mobile unit, the priority computation module being further operative to compute the scheduling priority for the mobile unit based on the unit urgency value for the mobile unit.

Function — _examining the status information and the unit parameters for each mobile unit and to assign a scheduling priority to each mobile unit_

Algorithm — _the priority computation module assigning a priority ... urgency value for the mobile unit._

PX 180 at 17:28-59. *See* PX 180 at Claim 14. *See, e.g., St. Isidore*, 2016 WL 4988246, at *13 (E.D.

Tex. Sept. 19, 2016). The term *a priority computation module* has "sufficiently definite structure

because the claim recited the 'objectives and operations'" of the processor. *Linear Tech. Corp. v.*

Impala Linear Corp., 379 F.3d 1311, 1319–21 (Fed. Cir. 2004).

Even if one accepts that the function of *a priority computation module* is as expansive as

Defendant argues, it remains true that an algorithm is disclosed in the claims. An algorithm in

computer systems "has broad meaning, for it encompasses in essence a series of instructions for

the computer to follow, whether in mathematical formula, or a word description of the procedure

to be implemented by a suitably programmed computer." *Typhoon Touch*, 659 F.3d at 1384 (Fed.

Cir. 2011). A series of functional steps, such as set forth in these claims, constitute an algorithm.

For example, if a claim calls for determining the mean of three numbers, the functions would be to (i) add the three numbers together to get the sum, and (ii) divide the sum by three. While there are two functions (adding and dividing) there is also a series of steps that constitute a mathematical formula—which is an algorithm. *See id*. Even if Defendant's proposed function is accepted, Defendant's argument fails because the claim has an algorithm. *See St. Isidore*, 2016 WL 4988246, at *13 (Finding that a step-wise algorithm that connotes structure).

2.   If means-plus-function treatment applies, the specification discloses sufficient structure

As set forth and reproduced above, a POSITA would understand that the structure for *a priority computation module* is a software module running on a processor. Claim 14 discloses the algorithm performed by the module. Accordingly, a POSITA would understand that the structure is a software module running on a processor. A POSITA would further understand that Claim 14 (and the specification) discloses an algorithm for *a priority computation module*:

1. Compute an urgency value for each data stream serving each mobile unit, the data stream urgency value for a data stream being computed based on the sensitivity to delay of the data stream and the delay currently experienced by the data stream

2. Assign a unit urgency value to the mobile unit, the unit urgency value being the highest data stream urgency value for the data streams serving the mobile unit

3. Compute the scheduling priority for the mobile unit based on the unit urgency value for the mobile unit

See PX 180 at Claim 14. *See also id*. at Claim 15 and 24.

II.   U.S. PATENT NO. 7,652,988 (CASE NO. 6:20-CV-01022) CLAIM TERMS

A.   "rate control engine configured to …" (claims 1, 12, and 24)

1.   The term is not subject to means-plus-function treatment

Defendant cannot overcome the presumption that § 112, ¶ 6 does not apply.

Defendant makes no attempt to distinguish case law finding the term "engine" to be

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structural. The term "engine" is "a known program construct that would be familiar to one of skill in the art to perform the function identified by its modifier." *Finjan, Inc. v. Eset, LLC*, 2017 WL 5501338, at *3-*5 (S.D. Cal. Nov. 14, 2017) ("The Court agrees that 'engine' is not a nonce term as advocated by Defendant, and that the claim provides sufficient structure for one skilled in the art. Defendant's request for application of 112 ¶ 6 is denied."); *see also Stragent, LLC v. Amazon.com, Inc*., 2011 WL 13152568, at *4 (E.D. Tex. June 27, 2011) ("[T]he term 'engine' conveys structure to one of ordinary skill in the art.").

Defendant's argument that the *rate control engine* is not structural fails. The title of the patent ("*hardware-based* rate control for bursty traffic") and the first line of the abstract ("[a] *hardware-based* rate control engine") make clear it is structural. PX 988 at Abstract (emphasis added). A POSITA would readily understand that hardware-based rate control engine has a known structure that incorporates components, circuits and memory, including registers and "local memory." *See, e.g.*, PX 988 at 4:37-5:15 (registers); 6:53-55 ("local memory"); Fig. 3. *TecSec, Inc. v. Int'l Bus. Machines Corp.*, 731 F.3d 1336, 1347 (Fed. Cir. 2013) ("A 'system memory' is sufficient structure to perform the 'storing data' function.").

Moreover, a series of steps, such as set forth in these claims, constitute an algorithm. *See St. Isidore*, 2016 WL 4988246, at *13. Claims 1, 12 and 24 all contain the following steps of the algorithm:

1. Allowing credits to accumulate in the credit bucket over multiple time-slices up to a maximum of the credit limit,

2. Allocating credits from the credit bucket to packet traffic that is associated with the credit bucket, and

3. Restricting the allocation of credits from the credit bucket in any single time-slice to the maximum drain rate.

See PX 988 at Claims 1 (9:16-22), 12 (10: 23-31) and 24 (11:21-28).

The term is not subject to § 112, ¶ 6 and it should be given its plain and ordinary meaning.

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2.   If means-plus-function treatment applies, the specification discloses sufficient structure

To the extent the Court applies § 112, ¶ 6, a POSITA would understand that the structure is components, circuits and memory, including registers or "local memory." According to the specification, "the rate control settings may be identified by the settings controller. The identified rate control settings are then written to the rate control engine of FIG. 4 and may be held in *local memory* within the rate control engine." PX 988 at 6:54-55. Defendant's proposed construction would improperly exclude the embodiment where the "rate control settings" are "held in local memory within the rate control engine." *Id*. at 6:54-55, 6:8-11 and Fig. 4. And these setting relate to the performance of the identified functions, including without limitation "time-slice, refresh rate, maximum credit limit, and maximum drain rate values." *Id.* at 2:25-27.

The Federal Circuit cautions that it "normally do[es] not interpret claim terms in a way that excludes embodiments disclosed in the specification ..." *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1276-77 (Fed. Cir. 2008). Accordingly, Defendant's attempt to limit the structure to specific registers fails because the specification contemplates implementation in memory for performing the identified functions. *See Adams Respiratory Therapeutics, Inc. v. Perrigo Co.*, 616 F.3d 1283, 1290 (Fed. Cir. 2010) ("A claim construction that excludes the preferred embodiment is rarely, if ever, correct and would require highly persuasive evidentiary support.") (internal quotations omitted).

Moreover, Defendant misstates the function. The function of the *rate control engine* is "for controlling packet traffic." For each of Claims 1, 12 and 24, a step-by-step algorithm is included in the claim:

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> 1. A method for controlling packet traffic using a hardware-based rate control engine comprising:
>
> establishing a refresh rate that represents a number of credits that are allocated to a credit bucket in a time-slice;
>
> establishing a maximum credit limit that represents the maximum number of credits that can be accumulated in said credit bucket;
>
> establishing a maximum drain rate that represents the maximum number of credits that can be drained from said credit bucket in a single time-slice;
>
> setting said refresh rate, said maximum credit limit, and said maximum drain rate in registers of a hardware-based rate control engine;
>
> allowing credits to accumulate in said credit bucket over multiple time-slices up to a maximum of said maximum credit limit;
>
> allocating credits from the credit bucket to packet traffic that is associated with said credit bucket;
>
> restricting the allocation of credits from said credit bucket in any single time-slice to the maximum drain rate;
>
> characterizing the flow of packet traffic that is associated with said credit bucket; and
>
> changing the maximum credit limit and the maximum drain rate as a set in response to said characterization.

Function

Algorithm

See PX 988 at Claim 1 (9:16-22). *See also id.* at Claims 12 (10: 23-31) and 24 (11:21-28). The term to be construed is not "register" but rather "rate control engine," and Defendant identifies functions of the former.

    B.   **"characterizing/characterize the flow of packet traffic" (claims 1, 12); "said traffic flow" (claim 24)**

There is no indication from the claims that "the flow" must be restricted to a particular time-slice. The question of "when" the flow must occur is irrelevant. The claim limitation does not require a particular time-slice for characterizing the flow.

Moreover, Defendant attempts to discredit Figure 7 which, as Plaintiff pointed out, describes "when" characterizing the flow occurs (even though "when" is not required by the claims). Defendant, argues there is "contradictory evidence" that shows "the characterization of the flow is not addressed consistently in the '988 specification." Dkt. 39 at 7. For support,

Defendant cites only an embodiment relating to Figure 6. But Defendant fails to explain how this passage creates an inconsistency or supports its contention that "when" characterizing the flow occurs is required by the claims.

C.   "rate control adaption engine [is] configured to" (claim 24)

1.   The term is not subject to means-plus-function treatment

A *rate control adaption engine* has a known structure that incorporates components, circuits, controllers and memory, including: a settings controller (636), settings memory (638) and a flow characterization engine (646). PX 988 at 7:27-34; Fig. 6. A *rate control adaption engine* is structural.

Claim 24 recites the algorithm for the rate control adaptation engine. PX 988 at Claim 24. Here, the disclosed algorithm for the rate adaptation engine characterizes traffic by (i) receiving the traffic characterization of the traffic flow from the traffic characterization (ii) selecting one of a refresh rate, maximum credit limit and maximum drain rate; (iii) adapting the maximum credit limit and maximum drain rate.

2.   If means-plus-function treatment applies, the specification discloses sufficient structure

The specification contains algorithms such that the term is not indefinite in a § 112, ¶ 6 analysis. In addition to the algorithm set forth in Claim 24, the characterizing and selecting functions are described in the specification. PX988 at 7:60-8:1 & 8:15-18; 6:60-7:1 & Fig. 7.

D.   "said traffic characterization engine" (claim 24)

Defendant has not met its burden to show by clear and convincing evidence that a skilled artisan could not discern the boundaries of the claim based on the claim language, the specification, and the prosecution history, as well as her knowledge of the relevant art area. *Haemonetics Corp. v. Baxter Healthcare Corp.*, 607 F.3d 776, 783 (Fed. Cir. 2010).

One of ordinary skill in the art would reasonably ascertain that "said traffic characterization engine" recited in Claim 24 is an engine to characterize a flow of traffic. *See In re Downing*, 754 F. App'x 988, 996 (Fed. Cir. 2018). A claim term is not invalid for indefiniteness if its antecedent basis is present by implication. *Cross Med. Prods., Inc. v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1319 (Fed. Cir. 2005) (holding that an antecedent basis can be present by implication). It is clear from the preceding clause that "said traffic characterization engine" is to provide a "characterization of said traffic flow." PX 988 at 12: 3-4 ("in response to said characterization of said traffic flow from said traffic characterization engine.").

Defendant argues that Plaintiff introduced a "brand new engine," specifically an "engine to characterize a flow of traffic." Not so. Claim 24 states that the rate control adaptation engine is configured to characterize traffic in response to "said characterization of said traffic flow from said traffic characterization engine." *See* PX 988 at 11:29-12:4. So, it is clear from this limitation that the traffic characterization engine characterizes traffic flow. A POSITA would understand the *traffic characterization engine* as the "flow characterization engine" that is included in the rate control adaptation engine. PX 988 at 7:27-34 ("In the embodiment of FIG. 6, the rate control adaption engine includes a flow characterization engine 646"); Fig. 6. Because the '988 Patent specification uses "traffic," "traffic flow" and "flow" interchangeably (PX 988 at 7:20-61), a POSITA would understand that Claim 24's *traffic characterization engine* is the *flow characterization engine* described in the specification. The term is not indefinite.

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III.   U.S. PATENT NO. 7,965,726 (CASE NO. 6:20-CV-01017) CLAIM TERMS

    A.   "determined priority includes minimum-performance guarantees" (Claims 1, 5, 10, 14, and 18)
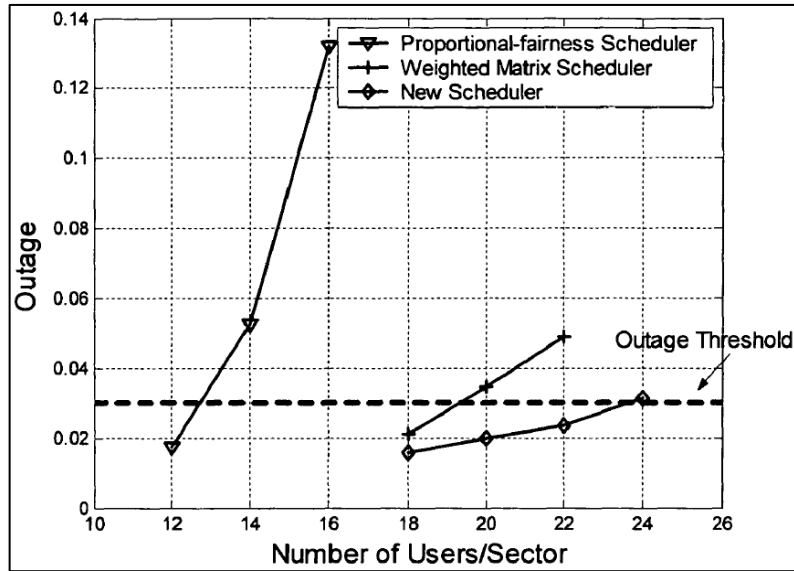
A POSITA would apply the plain and ordinary meaning of the claim term. A minimum-performance guarantee uses basic words that a POSITA would readily understand. In fact, it is hard to envision how a POSITA would not know what a minimum-performance guarantee is.

The specification clearly contemplates the concept of a minimum guarantee. *See* PX 726 at 2:9-11 ("Only the most simple and traditional means are known as giving different requirements for the bearers like the minimum guaranteed bit-rate requirement …"). Defendant attempts to sow confusion by claiming it is unclear what "performance" means. Performance is commonly used word in the English language, is not too technical in nature such that a construction would help the jury, and is certainly understandable to a POSITA. *Kroy IP Holdings, LLC v. Safeway, Inc.*, No. 2:12-cv-800-WCB, 2014 WL 3735222, at *2 (E.D. Tex., July 28, 2014). There is nothing confusing about the word "performance."

Even so, "performance" in the context of packet schedulers is explained in the specification:

> When comparing performance of different packet schedulers, a comprehensive search of the weighting factors that yield the best performance is performed for each individual packet scheduler under the mixed channel environment, then the performance of each packet Scheduler based on the optimal weighting factors is compared.

PX 726 at 7:20-25. Defendant's complaint that performance "could be measured in many ways" fails. Dkt. 39 at 11. That performance *could* be measured in many ways (i.e., that it is subject to various measurements) is irrelevant. In any event, the specification provides sufficient detail regarding "performance" using "optimal weighting factors." PX 726 at 7:20-25. Figure 4 expressly "illustrates the performance of different packet schedulers."

PX 726 at 3:44-45; Fig. 4. The term "performance" is understandable and supported in the specification.

Finally, Defendant contends it is unclear "how" a minimum-performance guarantee is included in a determined priority. Dkt. 39 at 12. Another red herring. It matters not "how" a minimum-performance guarantee is included in a determined priority; it matters only that it be included in accordance with the claims. Nevertheless, the specification provides ample explanation about how priority is determined using minimum performance guarantees. *See* PX 726 at 3:44-45; Fig. 4. The term is not indefinite.

B.   "a processor" (Claim 1) / "at least one processor and at least one memory storing computer program code" (Claim 5)

Defendant contends that "the specification does not provide any algorithm for determining each of these terms." Dkt. 36 at 23.
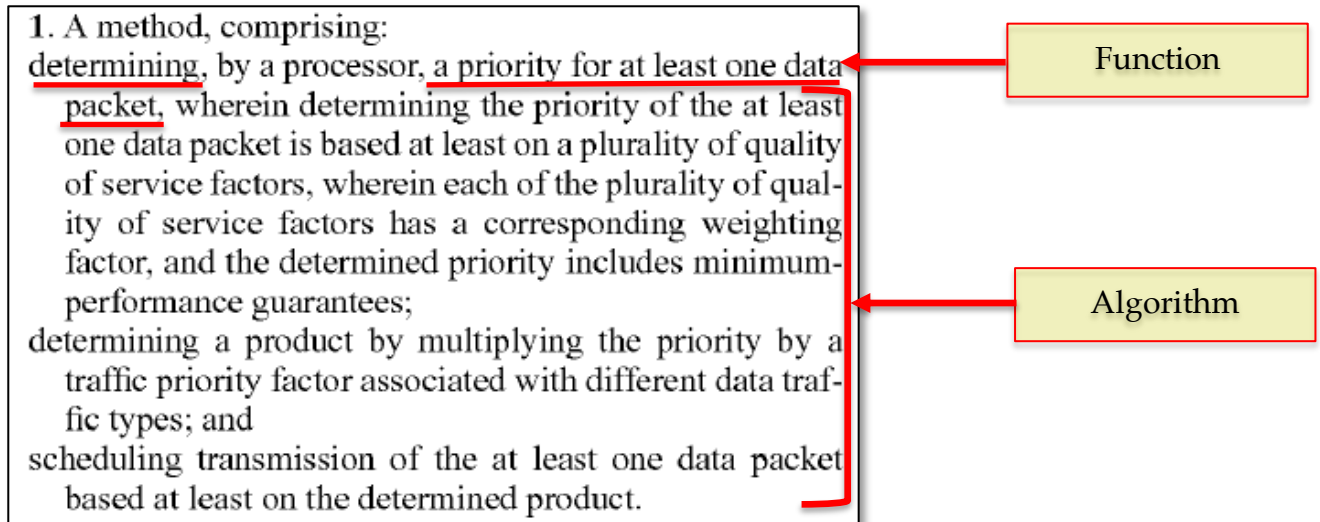
1.   <u>The term is not subject to means-plus-function treatment</u>

The term is straight-forward and does not require a construction. The term does not use the word "means" and thus carries a presumption that § 112, ¶ 6 does not apply. *Williamson*, 792 F.3d at 1348 (Fed. Cir. 2015). Defendant failed to address numerous cases cited by Plaintiff that held

claims of this nature did not overcome the presumption that § 112, ¶ 6 does not apply to the "processor" claim limitations. Means-plus-function treatment is inappropriate.

    2.   <u>If means-plus-function treatment applies, the specification discloses sufficient structure</u>

If means-plus-function treatment applies, the specification discloses an algorithm for the processor. Defendant again attempts to inoculate itself from the algorithm set forth in the claim by branding it as the function. Here, the function is "determin[e][ing] a priority for at least one packet of data." And, even if this Court accepts Defendant's expansive list as the function, that does not prevent the function from also containing the algorithm. Here, Claim 1 itself describes step-by-step algorithm for the processor:

PX 726 at 8:18-24. *See also* Claim 5. A series of functional steps, such as set forth in these claims, constitute an algorithm (e.g., using a "weighting factor", "multiplying the priority by a traffic priority", scheduling based on the product of the multiplication).

The '726 Patent specification provides additional detail for each as to the processor's algorithm. *See* PX 726 at 5:18-57; Claim 7; Fig. 3. Defendant argues that the mathematical formula in the specification "does not provide any algorithm for determining each of the terms in the

formula." Dkt. 39 at 14. But Defendant's never-ending requirement for additional detail is legally

incorrect. As cited throughout these briefs, the Federal Circuit simply requires an algorithm. The

level of detail Defendant contends is necessary about the processor's functional components is not

required. *See e.g., Intelligent Water Sols., LLC v. Kohler Co.*, No. 2:16-CV-689, 2017 WL

2444723, at *7 (E.D. Tex. June 5, 2017) (Listing specific algorithms known to one of skill in the

art may provide sufficient structure even if the specification does not provide details on their

operation.)

    C.   **"means for determining a priority for at least one data packet, wherein the priority means determines the priority of the data packet based at least on a plurality of quality of service factors, wherein each of the plurality of quality of service factors has a corresponding weighting factor and the determined priority includes minimum-performance guarantees" (claim 18)**

Plaintiff stands on its prior briefing.

Dated: October 21, 2021   Respectfully submitted,

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